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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,748	02/20/2004	Alexandros T. Demos	008514/DSM/BCVD/JW	7358

7590 01/24/2006

PATENT COUNSEL  
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EXAMINER
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NGUYEN, KHIEM D

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/783,748	<b>Applicant(s)</b> DEMOS ET AL.	
	<b>Examiner</b> Khiem D. Nguyen	<b>Art Unit</b> 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 9<sup>th</sup>, 2005 has been entered. A new rejection is made as set forth in this Office Action. Claims (1 and 4-22) are pending in the application.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

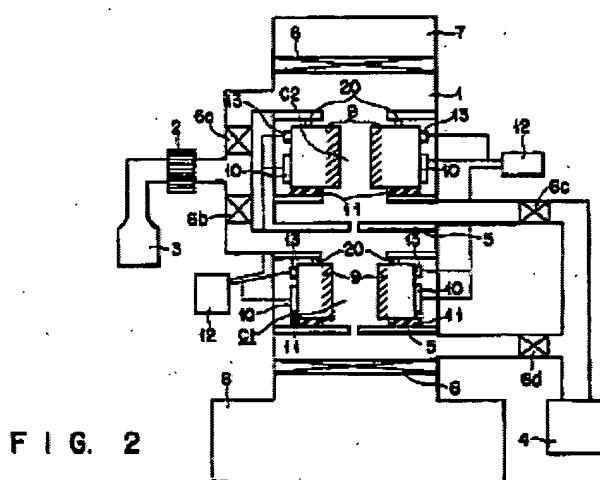
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 4-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtoshi et al. (U.S. Patent 5,539,211).

In re claim 1, Ohtoshi discloses a method of cleaning a chamber of an electron beam treatment apparatus, the method comprising:

generating an electron beam 7 that energizes a cleaning gas (O<sub>2</sub>, CF<sub>4</sub>) in the chamber of the electron beam treatment apparatus (col. 11, line 50 to col. 12, line 58 and FIG. 2);

monitoring an electron beam current (col. 14, lines 39-56); adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value; and stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a predetermined length of time (col. 11, line 50 to col. 12, line 14).



Note that, upon completion of cleaning the chamber, it would be obvious to stop the flow of the cleaning gas. Furthermore, if the gas bottle was empty and the chamber is not clean, the gas bottle had to be replaced or refill to continue the cleaning process.

Most gas bottle also has a regulator to control or adjust the amount of the cleaning gas.

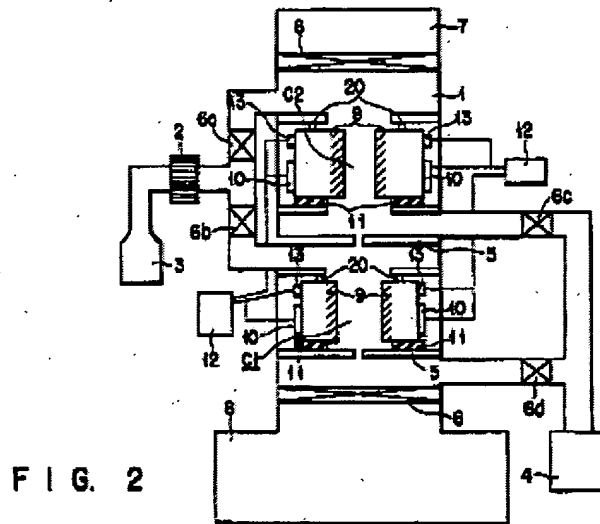
In re claim 4, **Ohtoshi** discloses that the cleaning gas comprises an oxygen-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 5, **Ohtoshi** discloses that the oxygen-based gas comprises one or more of O<sub>2</sub>, ozone, NO, and H<sub>2</sub>O (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 6, **Ohtoshi** discloses that the cleaning gas comprises a fluorine-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 7, **Ohtoshi** discloses that the fluorine-based gas comprises one or more of  $\text{NF}_3$ ,  $\text{F}_2$ ,  $\text{CF}_4$ ,  $\text{C}_2\text{F}_6$ ,  $\text{C}_3\text{F}_8$ ,  $\text{SF}_6$  (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 8, **Ohtoshi** discloses a method of cleaning an electron beam treatment chamber, the method comprising: generating an electron beam 7 that energizes a cleaning gas ( $\text{O}_2$ ,  $\text{CF}_4$ ) in the electron beam treatment chamber (col. 11, line 50 to col. 12, line 58 and FIG. 2);



and stopping the flow of cleaning gas after the cleaning gas pressure becomes substantially constant for a predetermined length of time (col. 11, line 50 to col. 12, line 14). Note that, upon completion of cleaning the chamber, it would be obvious to stop the flow of the cleaning gas. Furthermore, if the gas bottle was empty and the chamber is not clean, the gas bottle had to be replaced or refilled to continue the cleaning process. Most gas bottles also have a regulator to control or adjust the amount of the cleaning gas.

In re claim 9, **Ohtoshi** discloses that the cleaning gas comprises an oxygen-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

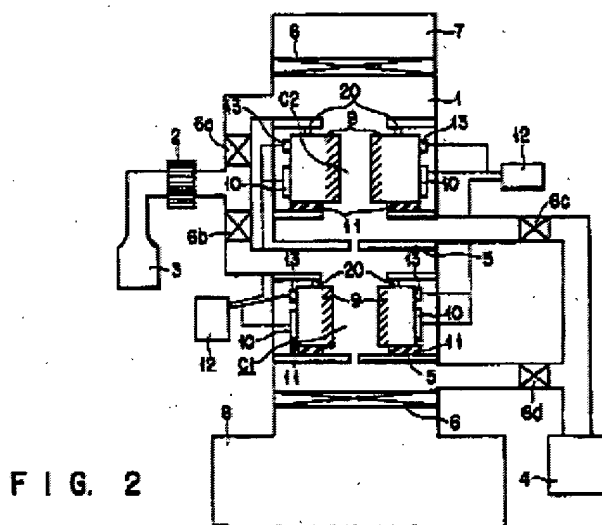
In re claim 10, **Ohtoshi** discloses that the oxygen-based gas comprises one or more of O<sub>2</sub>, ozone, NO, and H<sub>2</sub>O (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 11, **Ohtoshi** discloses that the cleaning gas comprises a fluorine-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 12, **Ohtoshi** discloses that the fluorine-based gas comprises one or more of NF<sub>3</sub>, F<sub>2</sub>, CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, SF<sub>6</sub> (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claims 13, 14, and 15, **Ohtoshi** discloses that a gas pressure of about 1 Torr or greater is maintained in the chamber (col. 11, line 50 to col. 12, line 9).

In re claim 16, **Ohtoshi** discloses a method of cleaning a chamber of an electron beam treatment apparatus, the method comprising: introducing a cleaning gas into the chamber; generating an electron beam 7 that energizes the cleaning gas (O<sub>2</sub>, CF<sub>4</sub>) in the chamber (col. 11, line 50 to col. 12, line 58 and FIG. 2);



setting in the chamber, an electron beam current of about 10 mA or above;  
adjusting a pressure of the cleaning gas to maintain the electron beam current at a

substantially constant value; and determining an endpoint of the cleaning process and stopping introduction of the cleaning gas when the cleaning gas pressure reaches a substantially constant value (col. 11, line 50 to col. 12, line 14). Note that, upon completion of cleaning the chamber, it would be obvious to stop the flow of the cleaning gas. Furthermore, if the gas bottle was empty and the chamber is not clean, the gas bottle had to be replaced or refilled to continue the cleaning process. Most gas bottles also have a regulator to control or adjust the amount of the cleaning gas.

Ohtoshi does not explicitly disclose maintaining the value for a length of time of 5 seconds.

However, there is no evidence indicating the time duration is critical and it has been held that it is not inventive to discover the optimum or workable length of time of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or of any unexpected results arising therefrom. Where patentability is to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

In re claim 17, Ohtoshi discloses that the cleaning gas comprises an oxygen-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 18, Ohtoshi discloses that the oxygen-based gas comprises one or more of O<sub>2</sub>, ozone, NO, and H<sub>2</sub>O (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 19, **Ohtoshi** discloses that the cleaning gas comprises a fluorine-based gas (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claim 20, **Ohtoshi** discloses that the fluorine-based gas comprises one or more of  $\text{NF}_3$ ,  $\text{F}_2$ ,  $\text{CF}_4$ ,  $\text{C}_2\text{F}_6$ ,  $\text{C}_3\text{F}_8$ ,  $\text{SF}_6$  (col. 12, lines 10-16 and col. 12, lines 59-65).

In re claims 21 and 22, **Ohtoshi** does not explicitly disclose stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a length of time of 5 seconds.

However, there is no evidence indicating the time duration is critical and it has been held that it is not inventive to discover the optimum or workable length of time of a result-effective variable within given prior art conditions by routine experimentation. See MPEP § 2144.05.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

***Response to Applicant' Amendment and Argument***

Applicants contend that the reference Ohtoshi et al. (U.S. Patent 5,539,211) herein known as Ohtoshi does not disclose each and every element of the claims, because Ohtoshi et al. does not disclose, "adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, and stopping the flow of cleaning

gas when the cleaning gas pressure becomes substantially constant for a predetermined length of time.”

In response to Applicants’ contention that Ohtoshi does not disclose, “adjusting a pressure of the cleaning gas to maintain the electron beam current at a substantially constant value, and stopping the flow of cleaning gas when the cleaning gas pressure becomes substantially constant for a predetermined length of time.” Examiner respectfully submits that upon completion of cleaning the chamber, it would be obvious to stop the flow of the cleaning gas. Furthermore, if the gas bottle was empty and the chamber is not clean, the gas bottle had to be replaced or refill to continue the cleaning process. Most gas bottle also has a regulator to control or adjust the amount of the cleaning gas.

Additionally, it is well known that current is nothing more than the movements of the electrons. Therefore, to control an electron beam, it is inherent that the current must be monitored and adjusted to maintain the electron beam current at a substantially constant value. The cleaning process inherently discontinues when the cleaning gas pressure becomes substantially constant for a determined length of time.

For these reasons, Examiner holds the rejection proper.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K.N.

January 19, 2006



**W. DAVID COLEMAN  
PRIMARY EXAMINER**